

Community spread of COVID-19 tied to patient survival rates at area hospitals

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High rates of COVID-19 in the county where a hospital is located appears to reduce survival rates among hospitalized patients with the virus, according to a new study from researchers in the Perelman School of Medicine at the University of Pennsylvania and at UnitedHealth Group. These findings were published in *JAMA Internal Medicine*.

"We have known that individual risk factors like age and gender, comorbidities such as obesity, and whether someone is a nursing home resident, are all part of what determines whether patients have a good or bad outcome. But our research shows it also matters where a patient is admitted," said lead investigator David Asch, MD, director of the Center for Health Care Innovation and a Professor of Medicine at the University of Pennsylvania.

The team analyzed nearly 40,000 patients with COVID-19 admitted to 955 hospitals across the nation between January 1 and June 30, 2020. They examined what proportion of those patients either died in the hospital within 30 days of being admitted or were discharged to hospice, which could also signal a likely death from the virus. They found that, on average, almost 12 percent of patients admitted with COVID-19 to hospitals nationwide died, but the [mortality rates](#) in the hospitals with the best outcomes was 9 percent compared to nearly 16 percent for the group of hospitals with the worst outcomes.

Data were also split into two periods of time—one extending from January to the end of April—widely regarded as the most challenging period of the first COVID-19 surge—and another from the beginning of May to the end of June—when case numbers started to decline. Across the two time periods, 398 of the hospitals studied had enough COVID-19 patients to allow a comparison of mortality. Patients in the early period had a mortality rate of more than 16 percent compared to roughly 9 percent in the group from May and June. All but one of the hospitals improved their survival rate—in fact, 94 percent improved their numbers by 25 percent or more.

"COVID-19 outcomes in U.S. hospitals have improved remarkably, and remarkably fast," said Natalie Sheils, Ph.D., research scientist at UnitedHealth Group. "But a death rate of more than 9 percent among hospitalized patients is still very high, and COVID-19 remains a very

dangerous disease."

While this data could correlate with increased knowledge of COVID-19 and treatment for its patients, the analysis found a different, prevailing factor.

"Improvement, in general, likely comes from experience in how to manage oxygenation for these patients, as well as new treatments like dexamethasone," Asch explained. "But what explains the variation in outcomes across hospitals and the variation in their improvement is an entirely different story. The factor most strongly associated with outcomes or their improvement, based on our data, was how much COVID-19 spread there was in the [hospital](#)'s surrounding community."

The team found that hospitals located in counties with higher COVID-19 case rates had worse outcomes. Hospitals situated in counties where case rates declined had the most improvement over time.

"With the current surge this winter, I'm worried hospitals will give up some of the positive gains from the summer," Asch said. "Not only will raw death numbers go up, but death rates may go up as well."

The association between high community case rates and high mortality is what prompted the goal to "flatten the curve." The idea was to keep rates as low as possible—even over a more prolonged period—because cases coming all at once was worse than cases spread out over time. This study's findings appear to support that view. While vaccines are being approved for emergency use, widespread vaccination of the general public is likely months away.

"If it is the community burden of COVID-19 that determines how well our hospitalized [patients](#) do, as our study shows, then the best advice hasn't changed: stay apart, wash your hands, mask up," Asch said.

"Hospitals need our help."

More information: *JAMA Internal Medicine* (2020). [DOI: 10.1001/jamainternmed.2020.8193](https://doi.org/10.1001/jamainternmed.2020.8193)

Provided by Perelman School of Medicine at the University of Pennsylvania

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